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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,522	09/23/2003	David A. Jackson	66396-057	2568

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EXAMINER	
COHEN, AMY R	

ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 02/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,522	JACKSON ET AL.	
	Examiner	Art Unit	
	Amy R Cohen	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 12-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 12-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 26 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Jackson (U. S. Patent No. 5,724,743).

Jackson teaches an image-based position determination system (Fig. 2 and 110) for optically scanning a target device related to an object, the system comprising: at least one camera and light subsystem (122), each subsystem having: an image sensing device (148) configured to view the target device (126) and to generate image information indicative of geometric characteristics of the target device (Col 13, lines 1-27 and Col 21, line 31-Col 22, line 61); at least one light emitting diode (142) operatively coupled to a strobe circuit, the at least one diode and circuit being configured to emit strobed light thereby illuminating the target device such that the light is retro-reflected to the image sensing device and the image sensing device detects and forms an image of the target (Col 7, lines 15-50 and Col 20, line 25-Col 21, line 30); and a visual indicator (119, the image on the display of the computer is a visible indicator that indicates whether the light emitting diode(s) is/are operable) for indicating a direction by which the object should be moved relative to the image sensing device (Col 13, lines 1-27 and Col 21, line 31-Col 22, line 61); and a data processing device (32, 34, 36) configured to couple to the visual indicator and the image sensing device to determine the orientation of the object based on the generated target image (Col 13, lines 1-27 and Col 21, line 31-Col 22, line 61).

Jackson teaches an image-based position determination system (Fig. 2 and 110) for optically scanning a target device related to an object, the system comprising: image sensing means (148) for viewing the target device (126) and for generating image information indicative of geometric characteristics of the target device (Col 13, lines 1-27 and Col 21, line 31-Col 22, line 61); light emitting means (142) for emitting strobed light thereby illuminating the target device such that the light is retro-reflected to the image sensing means and the image sensing means detects and forms an image of the target (Col 7, lines 15-50 and Col 20, line 25-Col 21, line 30); and visual indicator means (119, the image on the display of the computer is a visible indicator, Col 13, lines 1-27 and Col 21, line 31-Col 22, line 61) for indicating a direction by which the object should be moved relative to the image sensing means; and a data processing device (32, 34, 36) configured to couple to the visual indicator means and the image sensing means to determine the orientation of the object based on the generated target image (Col 13, lines 1-27 and Col 21, line 31-Col 22, line 61).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-9, 12, 13, 17-25, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson (U. S. Patent No. 5,724,743) in view of Butler (U. S. Patent No. 4,718,759).

Regarding claims 1-9, 12: Jackson discloses a three-dimensional camera based position determination system (Fig. 2 and 110), comprising: an optically scannable target (126) device fixedly attached to a target object (112-115); at least one camera and light subsystem (122), each subsystem having: an image sensing device configured to view the optically scannable target device and to generate image information indicative of geometric characteristics of the target device (148); and at least one light emitting diode (142) operatively coupled to a strobe circuit (Col 7, lines 45-50), the at least one diode and circuit being configured to emit strobed light thereby illuminating the optically scannable target such that the light is retro-reflected to the image sensing device and the image sensing device detects and forms an image of the target (Col 7, lines 15-50 and Col 20, line 25-Col 21, line 30); and a data processing device (32, 34, 36, Fig. 2) operatively coupled to the image sensing device, the data processing device being configured to determine the orientation of the target object based on the generated target image; and a visible indicator (119) that emits light within the visible spectrum, thereby indicating that the at least one light emitting diode is operative (the image on the display of the computer is a visible indicator that indicates whether the light emitting diode(s) is/are operable).

Jackson discloses the position determination system wherein the visible indicator emits lights within the visible spectrum (the computer display, 119, emits lights within the visible spectrum), and thereby indicates the at least one light emitting diode is operative.

Jackson discloses the position determining system wherein the at least one light emitting diode is an array of light emitting diodes (Col 21, lines 1-15).

Jackson discloses the position determining system wherein the number of light emitting diodes in the array is sixty-four (Col 21, lines 1-15).

Jackson discloses the position determining system wherein the target object is a vehicle wheel (112-115), and the data processing device is further configured to determine proper wheel alignment based on orientation of the vehicle wheel (Abstract).

Jackson discloses the position determining system wherein the image sensing device includes an electronic shutter that is synchronized with the at least one strobed light emitting diode such that an image is captured only when a target is illuminated (Col 7, lines 15-50).

Jackson discloses the position determining system wherein the image sensing device sensing device is a charge-coupled device video camera (Col 21, lines 16-20).

Jackson discloses the position determining system comprising: a current source configured to supply a current to the at least one light emitting diode (Col 21, lines 1-15, current must be supplied since the device is electronic).

Regarding claims 13 and 28: Jackson discloses a three-dimensional camera based position determination (Fig. 2 and 110) system, comprising: an optically scannable target device (126) fixedly attached to a target object (112-115); at least one camera and light subsystem (122) having: an image sensing device (148) configured to view the optically scannable target device and to generate image information indicative of the target device; and at least one light emitting diode (142) operatively coupled to a strobe light (Col 7, lines 45-50) thereby illuminating the optically scannable target such that the light is retro-reflected to the image sensing device and the image sensing device detects and forms an image of the target (Col 7, lines 15-50 and Col 20, line 25-Col 21, line 30); a data processing device (32, 34, 36 Fig. 2) operatively coupled to the image sensing device, the data processing device being configured to determine the orientation of the target object based on the generated target image (Col 20, line 25-Col 21, line 56); and a target image indicator that displays the status of the target acquisition by the data processing

device, wherein the status of the target acquisition indicates whether an obtained image of the scannable target device is acceptable (Col 13, lines 1-27).

Jackson discloses the position determining system comprising directional means for indicating the direction in which a target object should be repositioned, and for indicating that a target object has been properly positioned (Col 21, line 31-Col 22, line 61).

Regarding claims 17-25: Jackson discloses a three-dimensional camera based position determination system (Fig. 2 and 110), comprising: sensing means (148) for sensing an image of a target device (126), and generating image information indicative of geometric characteristics of the target device; and emission means for emitting strobed light that illuminates the optically scannable target such that the light is retro-reflected to the image sensing device and the image sensing device detects and forms an image of the target (Col 7, lines 15-50 and Col 20, line 25-Col 21, line 30); and data processing means (32, 34, 36, Fig. 2) for determining the orientation of the target object based on the generated target image (Col 20, line 25-Col 21, line 56); and visible indicator means (119) for visibly indicating whether the emission means is operative (the image on the display of the computer is a visible indicator that indicates whether the light emitting diode(s) is/are operable).

Jackson discloses the position determination system wherein the visible indicator emits lights within the visible spectrum (the computer display, 119, emits lights within the visible spectrum), and thereby indicates the at least one light emitting diode is operative.

Jackson discloses the position determining system wherein the target object is a vehicle wheel (112-115), and the data processing device is further configured to determine proper wheel alignment based on orientation of the vehicle wheel (Abstract).

Jackson discloses the position determining system wherein the image sensing device includes an electronic shutter that is synchronized with the at least one strobed light emitting diode such that an image is captured only when a target is illuminated (Col 7, lines 15-50).

Jackson discloses the position determining system comprising: attachment means (128) for fixedly attaching an optically scannable target device (130) to a target object (Fig. 9).

Jackson discloses the position determining system comprising directional means for indicating the direction in which a target object should be repositioned, and for indicating that a target object has been properly positioned (Col 21, line 31-Col 22, line 61).

Jackson discloses the position determining system comprising: a target object indicator means for indicating that the sensing means is sensing the target object (Col 13, lines 1-27).

Jackson discloses the position determining system comprising: a target object indicator means for indicating the state of the target acquisition by the data processing device (Col 13, lines 1-27).

Jackson does not disclose a position determining system wherein the light emitting diode emits an invisible light; wherein the light is infrared light.

Butler discloses a position determining system (Fig. 1) wherein the light emitting diode emits an invisible light; wherein the light is infrared light (Col 7, lines 28-42 and Col 16, lines 5-9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the position determining system of Jackson so that the light emitting diode emit infrared light, as taught by Butler, since Butler discloses that infrared light is more accurately read electronically (Butler, Col 7, lines 39-42).

Regarding the number of invisible light emitting diodes in the array being eighty: Jackson and Butler disclose a position determining system where the number of invisible light emitting diodes in the array is sixty-four. However, to choose a value for the number of diodes in the array to be eighty, absent any criticality, is only considered to be the "optimum" value of the number of diodes in the array, as stated above, that a person having ordinary skill in the art would have been able to determine using routine experimentation based, among other things, on the desired accuracy and since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. See ***In re Boesch***, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the number of invisible light emitting diodes in the array of Jackson and Butler to have eighty invisible light emitting diodes in order to have more diodes in the array, increasing the accuracy of the array and hence, the accuracy of the position determining system.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson and Butler as applied to claims 1-9, 12, 13, 17-25, 28 above, and further in view of Stam et al. (U. S. Patent No. 5,923,027).

Jackson and Butler disclose the position determining system as described above in paragraph 5.

Jackson and Butler do not disclose a position determining system wherein the image sensing device is a complimentary metal oxide semiconductor camera.

Stam et al. discloses an image sensing device, which is a complimentary metal oxide semiconductor camera (Col 5, lines 45-58).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image sensing device of Jackson and Butler to be a complimentary metal oxide semiconductor camera, as taught by Stam et al., since the complimentary metal oxide semiconductor camera is both economical and highly sensitive and therefore, more cost effective and accurate (Stam et al., Col 5, lines 45-58).

6. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jackson and Butler as applied to claims 1-9, 12, 13, 17-25, 28 above, and further in view of Mathes et al. (U. S. Patent No. 4,457,172).

Jackson and Butler disclose the position determining system as described above in paragraph 5.

Jackson and Butler do not disclose a position determining system comprising: a target object indicator array that includes at least one set of target object indicator light emitting diodes, wherein each light emitting diode of the first set corresponds to a target object; wherein the target object indicator array further includes a second set of target object indicator light emitting diodes, wherein each light emitting diode of the second set corresponds to a target object; and wherein the target object indicator array is operatively coupled to the data processing device such that the first set of target object light emitting diodes is energized when an image of the target object is acquired by the data processing device, thereby indicating that the target object is acquired by the data processing device, and the second set of target object light emitting diodes is energized when an image of the target object is not acquired by the data processing device, thereby indicating that the target object is not acquired by the data processing device; at least two sets of directional light arrays, each of the sets of directional light arrays including at least one directional light emitting diode, and wherein, the at least two sets of directional light arrays are

operatively coupled to the image sensing device such that when a single set of directional light is energized, a direction is indicated in which the target object should be repositioned such that the image sensing device may sense the target object and wherein, when all directional light arrays are on, the target object has been properly positioned; wherein the number of directional light arrays is four, and the directions in which the vehicle should be repositioned as indicated by the four arrays are backward, forward, left and right.

Mathes et al. discloses a position determining system (Figs. 1-8) comprising: a target object indicator array (34) that includes at least one set of target object indicator light emitting diodes (35-1, 35-2, 36-1, 36-2), wherein each light emitting diode of the first set corresponds to a target object (Col 10, line64-Col 11, line17); wherein the target object indicator array further includes a second set of target object indicator light emitting diodes (35-1, 35-2, 36-1, 36-2), wherein each light emitting diode of the second set corresponds to a target object (Col 10, line64-Col 11, line17); and wherein the target object indicator array is operatively coupled to the data processing device such that the first set of target object light emitting diodes is energized when an image of the target object is acquired by the data processing device, thereby indicating that the target object is acquired by the data processing device (Col 10, line64-Col 11, line17), and the second set of target object light emitting diodes is energized when an image of the target object is not acquired by the data processing device, thereby indicating that the target object is not acquired by the data processing device (Col 10, line64-Col 11, line17); at least two sets of directional light arrays (35-1, 35-2, 36-1, 36-2), each of the sets of directional light arrays including at least one directional light emitting diode, and wherein, the at least two sets of directional light arrays are operatively coupled to the image sensing device such that when a single set of directional light is energized, a direction is indicated in which the target object

should be repositioned such that the image sensing device may sense the target object and wherein, when all directional light arrays are on, the target object has been properly positioned (Col 10, line64-Col 11, line17); wherein the number of directional light arrays is four, and the directions in which the vehicle should be repositioned as indicated by the four arrays are backward, forward, left and right (Col 10, line64-Col 11, line17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the position detecting device of Jackson and Butler to include target object indicator arrays and direction light arrays, as taught by Mathes et al., so that the user could have a clear, simple visual indicator to indicate the status of the target object in addition to the computer display (119 of Jackson and Butler).

Response to Arguments

7. Applicant's arguments filed 15 November 2004 have been fully considered but they are not persuasive.

Regarding Applicant's arguments that Jackson does not teach a "visual indicator," Examiner disagrees. Jackson does teaches a visual indicator, 119, the image on the display of the computer is a visible indicator that indicates whether the light emitting diode(s) is/are operable. Applicant appears to be stating that the "visual indicator" is "a diode emitting light within a visible spectrum" however; this limitation is not claimed. Therefore, the "visual indicator" is given a broad interpretation under which, a display from a computer meets the limitations of the claim.

Regarding Applicant's arguments that Jackson does not teach "indicating whether an obtained image of the scannable target device is acceptable," Examiner disagrees. Col 13, lines 1-27 of Jackson discuss the acceptability of images obtained.

Regarding Applicant's arguments that Jackson does not teach "indicating a direction by which the object should be moved relative to the image sensing device," Examiner disagrees. Jackson teaches the visual indicator 119 which includes "indicating..." in Col 13, lines 1-27 and Col 21, line 31-Col 22, line 61.

Examiner notes that an Information Disclosure Statement has been received, however, it has not been scanned by the Office and could not be signed by the mailing of this Office Action.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following application and patents disclose position determination systems Robb et al. (U. S. PGPUB 2004/0128844), Jackson et al. (U. S. Patent No. 6,839,972), Reed et al. (U. S. Patent No. 6,807,740), McClenahan et al. (U. S. Patent No. 5,489,983), and Schirmer (U. S. Patent No. 3,756,724).

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

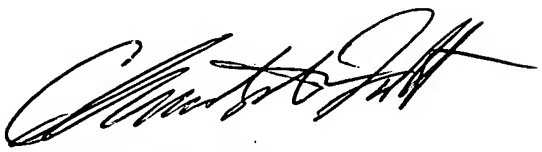
will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy R Cohen whose telephone number is (571) 272-2238. The examiner can normally be reached on 8 am - 5 pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ARC
January 31, 2005



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